Chapter 11/12 Test Review ***due on the day of the test. NO WORK, NO CREDIT***

- ***Review will not be graded unless answers are written on separate paper.***
- ***Eligibility to retest: complete accurate review, all homework and missing assignments must be turned in <u>prior</u> to retesting. Tutoring is required. Retesting window is 1 week following return of original test.***

1. Which equation matches the table of data?

x	*y*
1	4
2	16
3	64
4	256

a. $y = x^4$
b. $y = 4x$
c. $y = 4^x$

2. Look for a pattern in the data set. {(–1, 0.5), (0, 1), (1, 2), (3, 8), (5, 32)} Which kind of model best describes the data? Write the equation that models the data.

3. Look for a pattern in the data set. Which kind of model best describes the data? Write the equation that models the data.

Population Growth of Bacteria	
Time (hours)	**Number of Bacteria**
0	2,000
1	5,000
2	12,500
3	31,250
4	78,125

4. Graph $y = 3(2)^x$. 5. Graph $y = 2(4)^x$. 6. Graph $y = –(4)^x$.

7. The value of a gold coin picturing the head of the Roman Emperor Vespasian is increasing at the rate of 5% per year. If the coin is worth $105 now, what will it be worth in 11 years?

8. Write a compound interest function to model the following situation. Then, find the balance after the given number of years. $17,400 invested at a rate of 2.5% compounded annually; 8 years

9. The fish population of Lake Collins is decreasing at a rate of 4% per year. In 2002 there were about 1,250 fish. Write an exponential decay function to model this situation. Then find the population in 2008.

10. A radioactive isotope has a half-life of 13 hours. Find the amount of the isotope left from a 400-milligram sample after 52 hours. If necessary, round your answer to the nearest thousandth.

11. Tell whether the relationship is an inverse variation. Explain. If it is an inverse variation, state the constant of variation and write the equation.

x	***y***
2	409
3	240
4	194

12. Tell whether the relationship is an inverse variation. Explain. If it is an inverse variation, state the constant of variation and write the equation.

x	*y*
3	1680
5	1008
6	840

13. Let $x_1 = 15$, $y_1 = 8$, and $y_2 = 5$. Let *y* vary inversely as *x*. Find x_2.

14. Two variables, x and y, are inversely related. Let $x_1 = 10$, $y_1 = 5$, and $y_2 = 50$. Find x_2.

15. The frequency of a radio wave varies inversely as its wavelength. If a 300-meter wave has a frequency of 1,000 kilohertz, what is the wavelength of a wave that has a frequency of 150 kilohertz? Round your answer to the nearest meter.

Simplify the expression.

16. $(4)^{-2}$

17. Which function is greater at the given value? $y = 2^x$ or $y = x^2$ at $x = 9$

18. Identify the initial amount *a* and the growth factor *b* in the exponential function. $A(x) = 680 \cdot 4.3^x$

19. Suppose the population of a town is 2,700 and is growing 4% each year.
a. Write an equation to model the population growth.
b. Predict the population after 12 years.

Find the balance in the account.

20. $2,400 principal earning 2%, compounded annually, after 7 years

21. $3,800 principal earning 2%, compounded quarterly, after 7 years

22. Suppose a laboratory has a 26 g sample of polonium-210.The half-life of polonium-210 is about 138 days.
a. How many half-lives of polonium-210 occur in 276 days?
b. How much polonium is in the sample 276 days later?

23. A boat costs $15,500 and decreases in value by 10% per year. How much will the boat be worth after 5 years?

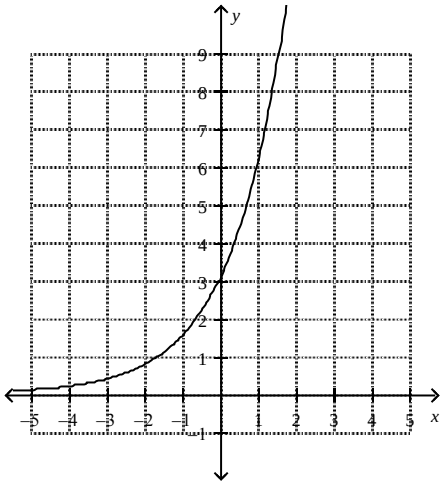
24. If a golf ball is dropped from a height of 27 feet, the function $f(x) = 27\left(\frac{2}{3}\right)^x$ gives the height in feet of each bounce, where x is the bounce number. What will be the height of the 4th bounce?

Spiral Exam Chapters 1 – 9

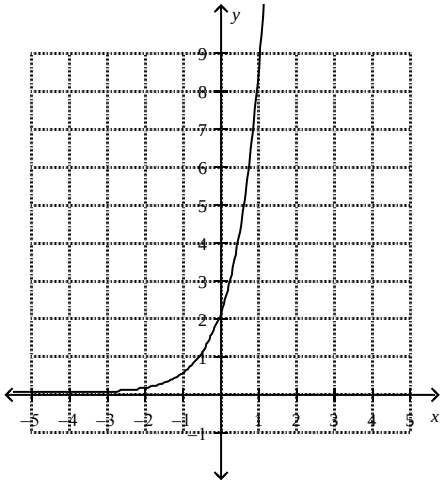
- *What are system of equations? Interpret their graph*
- *solve a linear inequality for y*
- *Match graphs to tables of data and equations*
- *domain and range*
- *what is a function. Identify data and equations that are functions*
- *what is f(x)?*
- *interpret linear graphs*
- *Compare the graphs of*
  quadratic: $y = x^2$, *linear:* $y = 2x$, *exponential:* $y = 2^x$, *and inverse variation:* $y = \frac{2}{x}$

Chapter 11/12 Test Review Answer Section

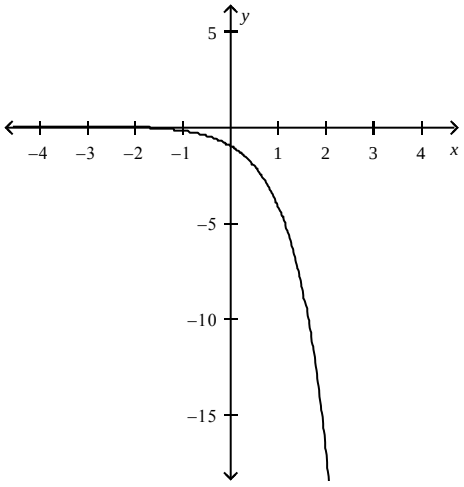
1. ANS: C OBJ: 8-7.2 Graphing Exponential Functions
2. ANS: exponential
   OBJ: 11-4.1 Graphing Data to Choose a Model
3. ANS: exponential
   OBJ: 11-4.2 Using Patterns to Choose a Model
4. ANS:



   OBJ: 11-2.3 Graphing y = ab^x with a > 0 and b > 1
5. ANS:



   OBJ: 11-2.3 Graphing y = ab^x with a > 0 and b > 1
6. ANS:



7. ANS: $179.59
   OBJ: 11-3.1 Exponential Growth
8. ANS: $17,400(1.025)^t$; $21,200
   OBJ: 11-3.2 Application
9. ANS: $y = 1,250(0.96)^t$
   The population in 2008 will be about 978 fish.
   OBJ: 11-3.3 Exponential Decay
10. ANS: 25 mg
    OBJ: 11-3.4 Application
11. ANS: The product *xy* is not constant, so the relationship is not an inverse variation.
    OBJ: 12-1.1 Identifying an Inverse Variation
12. ANS: The product *xy* is constant, so the relationship is an inverse variation.
    OBJ: 12-1.1 Identifying an Inverse Variation
13. ANS: x_2 = 24
    OBJ: 12-1.4 Using the Product Rule
14. ANS: x_2 = 1
    OBJ: 12-1.4 Using the Product Rule
15. ANS: 2,000 m
    OBJ: 12-1.5 Application
16. ANS: $\frac{1}{16}$
    OBJ: 8-1.1 Zero and Negative Exponents
17. ANS: 2^x
    OBJ: 8-7.1 Evaluating Exponential Functions
18. ANS: 680, 4.3
    OBJ: 8-8.1 Exponential Growth
19. ANS: $y = 2,700 \cdot 1.04^x$; about 4,323 people
    OBJ: 8-8.1 Exponential Growth
20. ANS: $2,756.85
    OBJ: 8-8.1 Exponential Growth
21. ANS: $4,369.52
    OBJ: 8-8.1 Exponential Growth
22. ANS: 2; 6.5 g
    OBJ: 8-8.2 Exponential Decay
23. 23. ANS: $9,152.6
    OBJ: 8-8.2 Exponential Decay

24. $5\frac{1}{3}\ ft.$